

The Scolitantidini II. The World's Smallest Butterfly? Notes on *Turanana*, and a New Genus and Species from Afghanistan (Lycaenidae)

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In the course of studying the palaearctic components of the Scolitantidini, the relationship of the genus *Turanana* to other genera within the tribe as well as of its species to one another appeared immediately complex. There is very limited material available for the genus and a substantial amount of field work will be required to provide insights on the group. Single specimens of a related but quite unusual member of this group were seen at both the British Museum (NH) and the Zoologische Sammlung des Bayerischen Staats. Subsequently, I obtained four additional specimens through the courtesy of S. Sakai.

These represent a unique species best placed in a new genus closely related to, but clearly separated from *Turanana*. The species should additionally be recognized as among the world's smallest known butterflies, in size being slightly larger than the smallest but larger than the average specimens of *Brephidium exilis* (6-10 mm forewing expanse, average about 8.5 mm, LACM, 50 specimens). In the matter of size this further exaggerates the extremes in the tribe Scolitantidini from wing expanses of 7 mm in the new entity to 24 mm in *Maculinea arionides*.

Micropsyche Mattoni new genus.

Type Species: *Micropsyche ariana*, new species.

Very small butterflies, primary wing span about 7 mm. Eyes hairless, palps dimorphic, 3rd segment either equal to or one-half 1st segment. Meso- and metathoracic leg calcaria short and thick and any tibial processes absent. Androconia absent. Prominent forewing UPS discoidal macule prominent, UPF with five macule postmedian constellation prominent with macule M_3 not offset distally UNH with distinct marginal and submarginal macules. Male genitalia: aedeagus without Chapman's process. Valves with crista and articulated to move mesally. Falces heavy proximal half tapering abruptly in distal half. Tegumen shape relatively straight in lateral view of dorso-frontal edge. Saccus absent. Female genitalia: papillae anales subquadrate, posterior apophysis strongly bent. Bursa round. Lamella vaginalis scoop shaped as double laminated troughs. No sexual dimorphism evident.

Micropsyche ariana Mattoni new species.

Holotype male: Head. eyes fringed white, scales, two rows black scales parallel below antennae. Eyes. hairless. Palps. (Fig. 3) ratio segments 1:2.6:0.8, white scales above, fuscous below, dense black hair scales dorsally and medially. Antennae. white below, white with fuscous scales at joints above.

Thorax. Legs. proleg (Fig. 6; Table 1) Mesothoracic leg (Fig. 9) covered white hair scales. Distitarsus with single spine. Without endodont lobes. Tegula. specimen lost.

Wings. Expanse FW 7.1 mm. Venation (Fig. 12; Table 1) UPS. Ground color medium brown-gray. Faint cyanic overlay blue scales without clear color differentiation. Androconia lacking. UPF. Discoidal macule prominent, black, off-white marking basal and distal. Postmedian constellation five black elongate macules extending CU₂ to M₁, haloed with white. Submarginal and marginal macules indistinct but demarked by white in marginal space between them. Fringe white, not checkered. UPH. Three postmedian haloed macules in M₁, M₂ & M₃. Weak discoidal macule with faint white borders proximal and distal. Marginal markings as UPF. UNS. Ground light brown, slightly darker in basal quarter. UNF. Maculation as UPF, except macules more prominent on lighter ground. Submarginal macules distinct, punctuated by white, marginal band distinct. UNH. Distinct discoidal macule. Postmedian macules from 1A through R. Haloed as UNF. Submarginal and marginal markings as UPF.

Genitalia. (Figs. 14, 15, 28, 29) As under generic description. Aedeagus with two sets of cornuti. Weakly bi-lobed.

Allotype Female: Features as above, no evidence of sexual dimorphism in any characters except genitalia. Genitalia. (Fig. 33) As in generic description.

Variation. The most striking variation appears in the dimorphism of the palps (Fig. 3 A & B). In the type series of five specimens, 3 males have palps of type A, one male and the single female type B. In wing pattern, there is minor variation in depth of the UPS ground, the number of postmedian macules of both UPH and UNH, and presence or absence of the UNS marginal macules. There are insufficient specimens to reliably document variation.

Type Data. Holotype and male paratype 1, Afghanistan, Mt. Khwajaghar, Koh-i-Baba Mts., 3600-4000 meters, 2 VII 75, allotype and male paratype 2, same locality, 3 VII 75, leg. T. Shimizu. Paratype 3, male, same locality, 17 VI 73, no leg. data (BMNH colln.).

Type Disposition. Holotype and allotype will be placed in the BMNH with paratype 3. Paratypes 2 and 3 are property of S. Sekai.

Biology. There are no data.

Diagnosis. By virtue of gross conformation of the male genitalia, *M. ariana* clearly is in the tribe Scolitantidini. Comparative morphological features, including palps, legs, and genitalia are illustrated in Figs. 3-36, and major differentiating characters are summarized in Table 1. The genus, which is monotypic, would appear most closely related to *Turanana*, a genus comprised of at least six species and *Glaucopsyche*, conservatively comprised of at least eight species. With regard to major characters of the legs: ratio of segments, tibial process, calcaria, and

Table 1

Comparison of *Micropsyche*, *Turanana* and *Glaucopsyche* based on morphological characters and major wing pattern elements which are variable within the related group.

Character	<i>Micropsyche</i> <i>ariana</i>	<i>Turanana</i> <i>cytis</i>	<i>Turanana</i> <i>panagaea</i>	<i>Glaucopsyche</i> <i>alexis</i>	<i>Glaucopsyche</i> <i>lygdarnus</i>	<i>Glaucopsyche</i> <i>melanops</i>
¹ Eye Hairs	0	1	2	3	3	3
Mesothoracic, leg, dorsal tibial process	0	0	0	+	+	+
² Mesothoracic, leg, calcaria shape	1	2	2	3	3	3
Venation:						
A:B	1.11:	1.00:	0.81:	1.00:	0.90:	0.93:
B:C	2.00	1.62	1.50	1.86	2.00	1.67
UPF, discoidal macule (σ)	+	+	+	0	0	0
UPF, postmedian constellation	+	+	0	0	0	0
UNH, marginal macules	+	+	+	0	0	+
UNF, M ³ postmedian macule offset proximally	0	+	+	0	0	0
Androconia	0	0	0	+	+	+
Aedeagus--Chapman's process	0	0	0	+	+	+
Valves--Crista	+	0	0	0	0	0
³ Valves--Articulation	L	L	L	D	D	D
⁴ Falces	C	F	F	B	B	B
⁵ Tegumen shape lateral aspect	S	S	S	H	H	H
Saccus	M	+	+	+	+	+
⁶ Bursa shape	R	E	E	E	E	E
⁷ Papillia anales	S	S	S	T	T	T
⁷ Papillia anales shape	S	S	S	T	T	T
⁸ Lamella vaginalis	D	B	B	S	S	S

Legend: + = present; 0 = absent; M = minute; ¹Eye Hairs: 0 = none; 1, few >0.1 mm; 2, few <0.05 mm; 3, many >0.1 mm; ²Calcaria: 1 = short, thick; 2 = long, thin; 3 = long, thick; ³Valves: L = lateral; D = dorso-ventral; ⁴Falces: C = thick basal, fine proximal; F = thin, long; B = heavy; ⁵S = approximately straight dorso-frontal shape (lateral view); H = as before, humped; P = strongly humped; ⁶R = round; E = elongate; ⁷S = subquadrate; T = elongate subtriangular; ⁸S = shovel shape; B = bowl shape; D = deep scoop shape

chaetotaxy, the intragenetic variation is minimal while the differences between genera are constant. Distitarsus chaetotaxy (Figs. 9 & 10) is consistent for both *Glaucopsyche* and *Turanana*. *M. ariana* alone has no eye hairs. *M. ariana* shares with all *Turanana* lack of androconia. In the male genitalia, *M. ariana* has a unique falx conformation, but shares a similar shape of the tegumen with *Turanana*. The aedeagus of *M. ariana* and *Turanana* (all species observed) are similar, lacking Chapman's process, so evident in *Glaucopsyche*. What may be a major feature in functional similarity within *M. ariana* and *Turanana* is the valve hinging or articulation. In these genera the valves move predominantly mesally in comparison with *Glaucopsyche* where the movement is dorsal. The matter is exemplified in the lateral views of the genitalia (Figs. 15-21). Shape of the valves themselves appears to be of use only as a specific character (Figs. 22-27). The substantial variation within *Turanana* is only partially illustrated (see also Fig. 18) in that subspecific variation in the character emerged at least in the case of *T. panagaea* from Turkey and Iran. Beuret (1959. Mitt. Basel Ent. GES 9: 80-84), placing major weight on valve shape went so far as to suggest *T. panagaea* is related to *Actizera* and *T. cytis* to *Philotes sonorensis*. The assertion was without merit. *M. ariana* is unique in the group in that its valves have a crista. In the female genitalia the shape of the papillae anales are subquadrate in *M. ariana* and *Turanana*, compared with a subtriangular shape in *Glaucopsyche*. In *Turanana* there is considerable variation in the structure (see Fig. 36 A, *T. panagaea*) which is not evident in *Glaucopsyche*. Lastly, the formation of the lamella vaginalis in *M. ariana*, as two curved sclerotized curved plates (Fig. 33 B & C) and the round bursa copulatrix are unique, although the lamella more closely resembles *Turanana* species than those of *Glaucopsyche*. On these bases, I intuitively believe *Micropsyche* is a unique group, most closely related to *Turanana*.

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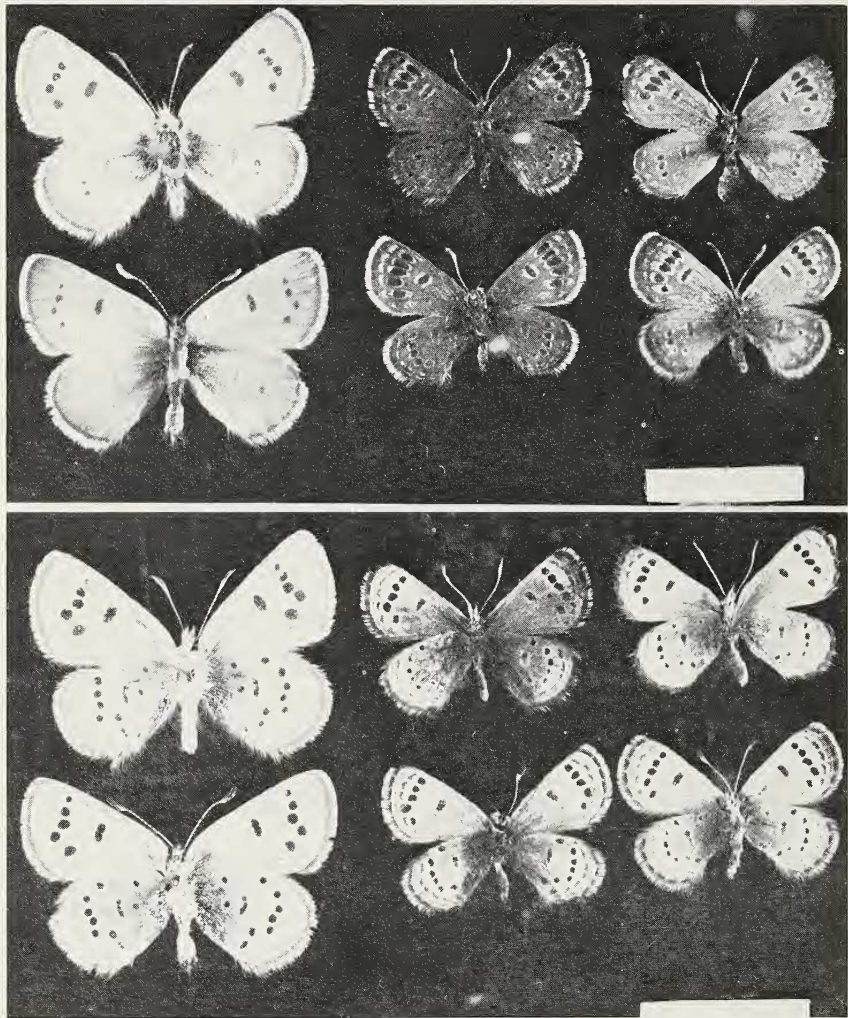


Fig. 1. 1st Col. *Turanana cytis* male above, female below, Iran: Kudara, 17 VI 1887, Gr. Gr. (BMNH); 2nd Col. *Micropsyche ariana* male paratype 1 above, 2 below; 3rd Col. same holotype male above, female below. Specimens enlarged about 2X. Mark $\bar{=}$ 1.0 cm.

Fig. 2. Undersides of Fig. 1.

- Fig. 3. Palp *M. ariana*, A) male para. 3, B) male para. 2.
Fig. 4. Palp *T. panagaea*, male, Turkey, RHTM 152.
Fig. 5. Palp *G. alexis*, male, Finland, RHTM 169.
Fig. 6. Male prothoracic leg. *M. ariana* para. 2.
Fig. 7. Ibid. *T. panagaea*, RHTM 157.
Fig. 8. Ibid. *G. alexis*. RHTM 170.
Fig. 9. Male mesothoracic leg. *M. ariana*, showing chaetotaxy of disti-tarsus para. 2.
Fig. 10. Ibid. *T. panagaeae*, RHTM 174, showing chaetotaxy of disti-tarsus.
Fig. 11. Ibid. *G. melanops*, RHTM 138, showing chaetotaxy of disti-tarsus.
Fig. 12. Wing venation, *M. ariana*, male holotype.
Fig. 13. Tegula, *T. cytis* (dotted line), *G. alexis* (solid line).
Fig. 14. Male genitalia, caudal view, *M. ariana* para. 2.
Fig. 15. Male genitalia, lateral view, *M. ariana*, para. 2.
Fig. 16. Ibid. *T. cytis*, RHTM 89.
Fig. 17. Ibid. *T. panagaeides*, RHTM 112.
Fig. 18. Ibid. *T. anisophthalma*, RHTM 111.
Fig. 19. Ibid. *G. alexis*, RHTM 170.
Fig. 20. Ibid. *G. lygdamus*, RHTM 76-11.
Fig. 21. Ibid. *G. melanops*, RHTM 67.
Fig. 22. Right valve, caudal view, flattened, *M. ariana*.
Fig. 23. Ibid. *T. panagaeides*, RHTM 159.
Fig. 24. Ibid. *T. panagaea*, RHTM 158.
Fig. 25. Ibid. *T. cytis*, RHTM 89.
Fig. 26. Ibid. *G. alexis*, RHTM 169.
Fig. 27. Ibid. *G. melanops*, RHTM 137.
Fig. 28. Aedeagus, ventral view, *M. ariana*.
Fig. 29. Aedeagus, lateral view, *M. ariana*.
Fig. 30. Ibid. *T. panagaeides*, RHTM 159.
Fig. 31. Ibid. *G. alexis*, RHTM 169.
Fig. 32. Aedeagus, lateral view, *G. alexis*, RHTM 169.
Fig. 33. A) Papilla anale & anterior apophysis, B) Lamella vaginalis, lateral view & C) Lamella vaginalis, ventral view, *M. ariana* allotype.
Fig. 34. Ibid. *G. alexis*, RHTM 178.
Fig. 35. Ibid. *G. melanops*, RHTM 180.
Fig. 36. Ibid. *T. panagaea*, papilla anales of 3 specimens shown for variation, A₁, A₂, A₃.

